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A FARM BUSINESS STUDY (IN THE  
HAMIOTA AREA OF MANITOBA)

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T. O. RIECKEN)



Economics Division, Marketing Service  
Canada Department of Agriculture  
in co-operation with the  
Department of Political Economy  
University of Manitoba



Ottawa, September, 1952.



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## FOREWORD

This study was conducted by the Economics Division, Marketing Service, Canada Department of Agriculture in co-operation with the Department of Political Economy, University of Manitoba. The field survey was made during the summer of 1948 under the direction of O.P. Blaich and J.G. MacKenzie, who were assisted in the field enumeration by J.P. Hudson and D.M. King, all of the Economics Division staff at Winnipeg.

The assistance of Associate Professor Sol Sinclair, Department of Political Economy, University of Manitoba, in organizing the early part of the study and his continuing assistance throughout the analysis is gratefully acknowledged. Acknowledgement is also made of the assistance of Mr. C. H. Chappell, Provincial Municipal Assessor, Province of Manitoba, in outlining the soil boundaries of the area.

The co-operation of the farmers and municipal officials was excellent throughout. Without their assistance the study could not have been made.

The assistance and interest of all others who helped in the study is also acknowledged.



## TABLE OF CONTENTS

|  | <u>Page</u> |
|--|-------------|
| SUMMARY .....  | i           |
| INTRODUCTION .....                                   | 1           |
| GENERAL CHARACTERISTICS OF THE AREA .....            | 1           |
| Location .....                                       | 1           |
| Climate .....  | 1           |
| Soils and Other Physical Factors .....               | 3           |
| The Survey .....                                     | 3           |
| Settlement of the Area .....                         | 3           |
| Land Acquisition and Tenure .....                    | 5           |
| Prosperity of the Area and the Operators .....       | 6           |
| Net Worth of the Present Operators .....             | 6           |
| Assets .....   | 7           |
| Liabilities .....                                    | 8           |
| FARM ORGANIZATION .....                              | 8           |
| Land Use .....                                       | 8           |
| Livestock .....                                      | 9           |
| Farm Capital .....                                   | 11          |
| Farm Capital and Size .....                          | 11          |
| Farm Capital and Tenure .....                        | 11          |
| Machinery and Equipment .....                        | 12          |
| Farm Buildings .....                                 | 13          |
| Receipts .....                                       | 14          |
| Expenses .....                                       | 15          |
| Living Expenses .....                                | 16          |
| Measuring Farm Success .....                         | 17          |
| Common Measures .....                                | 18          |
| MEASURING THE EFFICIENCY OF FARM OPERATION .....     | 19          |
| Size of Business .....                               | 20          |
| Crop Yields .....                                    | 21          |
| Livestock Production .....                           | 22          |
| Combination of Enterprises .....                     | 24          |
| Efficiency in the Use of Factors of Production ..... | 27          |
| Efficiency in Use of Labour .....                    | 27          |
| Efficiency in Use of Capital .....                   | 28          |
| Building Investment and Use .....                    | 29          |
| Organizing the Farm for Higher Profits .....         | 30          |



SUMMARY

The Hamiota area is similar to much of the Northern Black Earth Soil zone in that it lies in an area that has relatively favourable growing conditions. The soils are generally very fertile. Rainfall is usually sufficient to permit good growth of crops and grasses and moisture efficiency is relatively high. Yields of grain crops are well above provincial averages and variation in yield from year to year is fairly low. The quality of grains produced is generally good.

The farms are not excessively large in area nor are there many small farms. The average size of farm for the survey was 447 acres with just less than two-thirds improved. Wheat occupied 25 per cent of the cropland, but oats and barley combined accounted for nearly one-third of it. Summerfallow was important and occupied 38 per cent of the cropland. Other crops and grasses play a very small part in the land utilization picture.

Trends in farm numbers and total area in farms indicated that the area has been settled for some time. The total area in farms has not changed much in the last 30 years, although some land is still being improved. Farm numbers increased until 1936 since which time they have decreased slightly. It is likely that there will be some continuing trend to fewer farms as the smaller farms become absorbed into neighboring farms. However, it is not likely that the trend towards the larger farms will be as rapid or as pronounced as that which has taken place in the prairie areas. These farms have fairly large acreages of unimproved land suitable for pasture; the fields contain many bluffs and sloughs and are not suited for large power units. With some diversification it is fairly easy to establish a suitable farm without needing too large an area.

The farmers are relatively well off. The average net worth of the operators in the year of the survey was over \$23,000. Liabilities were small, land debt making up more than three-quarters of the total. Nearly 40 per cent of the farms were free of debt.

There was an average of \$8,300 invested in farm real estate, \$4,000 in machinery and equipment, \$2,100 in livestock and \$1,100 in seed, feeds and other supplies. The average value of real estate per improved acre was about \$29. The farms are highly mechanized, having a machinery investment of about \$14 per improved acre. Ninety-five per cent of the farms have tractors and 25 per cent have two. The majority of the farms have cars or trucks, and at least a third of them have combines.

Wheat provided more than one-third of the current farm receipts, oats and barley nearly one-fifth, and other crops about six per cent. Cattle accounted for the largest proportion of receipts from livestock. Sales of livestock and livestock products made up about 25 per cent of the total receipts.

Nearly all farms have some livestock. Beef cattle production was found to be the major livestock enterprise. Hogs were kept on about three-quarters of the farms, but usually just to supply home needs. Hog production could be expanded as the relationship between feed and hog prices becomes favourable. In most cases sufficient buildings are available and some hog production could be carried on without serious competition for farm labour.

Although the greater part of the income was from crops, farming practices were fairly diversified. Cereal crops provided the most income and generally are the most suitable. It is unlikely that they will be displaced by any other crops. However, some consideration should be given to crop rotations having more grasses and legumes to help in controlling soil erosion and weeds and for the maintenance of soil fertility.

The area is well suited to diversified farming and for the most part the smaller farms stand to benefit most from diversification; their land area is limited but often they have sufficient labour and pasture available. However, in some cases existing farms are much too small to permit efficient use of the family labour and are also too small to permit economical use of machinery.

## A FARM BUSINESS STUDY IN THE HAMIOTA AREA OF MANITOBA

### INTRODUCTION

This report forms part of a broader inquiry into the economic aspects of the organization and management of Manitoba farms in representative type of farming areas on broad and important soil regions. This study was made on soils of the Northern Black Earth-Zone.

While the general purpose of the study was to obtain information on the land resources and on the problems associated with its use, the more specific objectives may be stated as follows:

1. To find out how the land is being used;
2. To find out how the farms are owned and managed, and how they are organized, that is how large they are and what kind and types of crops and livestock are grown or raised on these farms;
3. To ascertain from what sources income is obtained and on what it is spent;
4. To study progress made by the farm operator;
5. To study the degree of efficiency and success attained in the operation of the farm.

### GENERAL CHARACTERISTICS OF THE AREA

#### Location

The area covered by the survey is a block of land about 18 miles square, surrounding the town of Hamiota. It is in western Manitoba, just north of the main line of the Canadian National Railways. The Riding Mountain National Park is about 25 miles to the north and the city of Brandon about 45 miles to the southeast. (Figure 1 shows the survey area)

#### Climate

Climatically the area is suited for the production of the common cereal crops grown in Manitoba; also, every kind of commercial livestock produced within the province is produced here. There is a frost-free period of 110 to 115 days, which is 15 to 20 days less than the frost-free period of southern Manitoba, but about ten days longer than the frost-free period in the most northerly agricultural area of the province.

The annual precipitation of the area is 16 to 17 inches. The average annual precipitation at Minnedosa, about 25 miles to the east, is 17



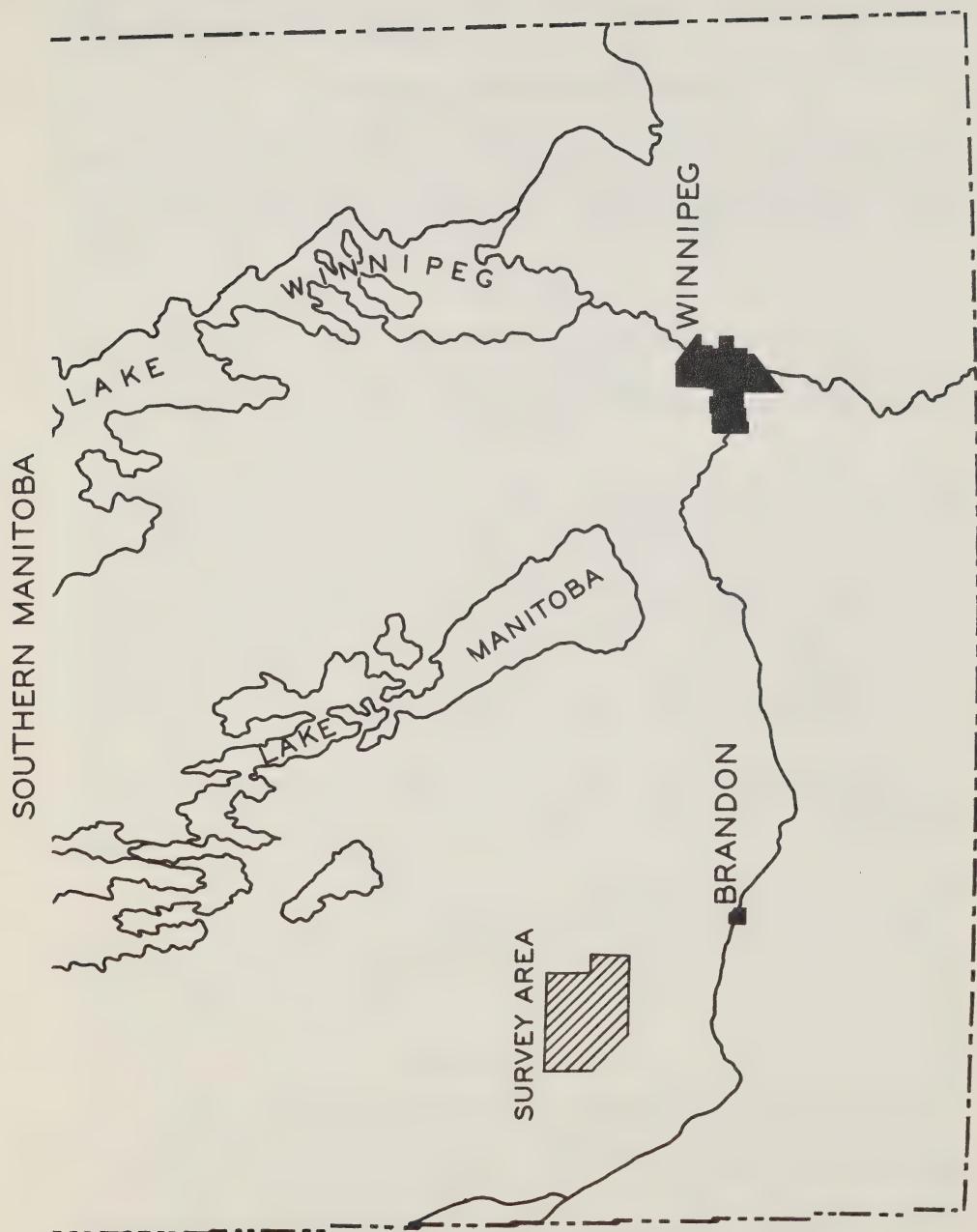


FIGURE I. SHOWING LOCATION OF THE SURVEY.



inches and is about 16 inches at Russell, some 50 miles to the northwest. On the average about half the precipitation falls in the growing season from April to July and another 4.5 to five inches falls in the months of August, September and October.

#### Soils and Other Physical Factors

The soils of the area are northern black earths of the Newdale Association. The soils are very fertile and of clay loam texture. They are described as follows: "Northern black earth soils developed on glacial till under intermixed prairie and aspen woods. Topography is undulating with occasional to numerous sloughs or undrained depressions." 1/

#### The Survey

The survey was made in the summer of 1948 and the data were collected for the business year of June 1, 1947 to May 31, 1948. The data concerned the use of the land, the farm inventory, amounts of receipts and expenses and farm debts. In addition some information relating to the operator and his family was also obtained.

Farm business records were obtained from 93 farm operators. This represents a 29 per cent sample of the total number of farms in the survey area. The farms were stratified by size of farm; within each size group the farms were selected at random. Generally the number of records obtained in any size group was in the same proportion to the total farms in that group as that group total was to the total number of farms in the area. However, because of the variation in farms it was necessary to take a larger proportion of records in some groups. This variation was more pronounced among the larger farms. The number of additional records required was determined by the application of a variance test to the records obtained at a point about half-way through the survey.

The size groups and the records obtained in each group were as follows: up to 240 acres, five records; 241 to 400 acres, 20 records; 401 to 560 acres, 27 records; 561 to 720 acres, 27 records; farms larger than 720 acres, 14 records.

The growing season of 1947 could be considered normal for the area. The precipitation recorded at Minnedosa for 1947 was 18 inches, just above the long-time average. The average yield of wheat for the farms of the survey was 24 bushels per acre, 37 bushels for oats and 23.5 bushels for barley.

#### Settlement of the Area

The main agricultural development in Manitoba really began about 1875 on the prairie sections of southwestern Manitoba and settlement in the survey area was not far behind. As the area was fairly well served by railroads and was accessible from Brandon, development was quite rapid.

1/ Land Classification Map, Roseburn area of Manitoba, Manitoba Soil Survey, University of Manitoba, 1940.

While the survey area is not wholly included in the municipality of Hamiota, nor is all of this municipality in the survey area, the two are for the most part similar; development, land use, and livestock numbers, etc., in the municipality of Hamiota would probably be quite representative of similar trends in the survey area.

Settlement and development of the area had become fairly stable by 1916. The number of farms was highest in 1936 but has declined since that time (Table 1). The total area and the improved area in farms have been fairly constant since 1916. The number of acres in field crops has decreased since 1926 and the amount of summerfallow has increased.

Table 1.- Number, Total Area, Improved Area and Area in Field Crops of Occupied Farms, Municipality of Hamiota, 1916-1946

| Year      | : : : : : Per cent of |                       |                 |                       |                      |
|-----------|-----------------------|-----------------------|-----------------|-----------------------|----------------------|
|           | : Number of farms     | : Total area in farms | : Improved area | : Area in field crops | : farm land improved |
| - acres - |                       |                       |                 |                       |                      |
| 1916      | 289                   | 134,619               | 87,881          | 61,241                | 65.3                 |
| 1921      | 322                   | 136,033               | 89,699          | 62,686                | 65.9                 |
| 1926      | 300                   | 130,563               | 83,939          | 64,617                | 64.3                 |
| 1931      | 328                   | 137,112               | 88,464          | 56,290                | 64.5                 |
| 1936      | 340                   | 133,479               | 87,794          | 56,878                | 65.8                 |
| 1941      | 319                   | 136,490               | 91,595          | 51,928                | 67.1                 |
| 1946      | 315                   | 130,965               | 88,314          | 52,853                | 67.4                 |

Source: Census of Canada

Table 2.- Livestock Population, Municipality of Hamiota, 1916-1946

| Year       | : : : : : |          |         |         |
|------------|-----------|----------|---------|---------|
|            | : Horses  | : Cattle | : Swine | : Sheep |
| - number - |           |          |         |         |
| 1916       | 3,927     | 4,663    | 1,752   | 200     |
| 1921 a/    | -         | -        | -       | -       |
| 1926 a/    | -         | -        | -       | -       |
| 1931       | 3,267     | 5,285    | 3,253   | 626     |
| 1936       | 3,134     | 5,749    | 1,971   | 796     |
| 1941       | 2,663     | 4,534    | 3,104   | 657     |
| 1946       | 1,640     | 5,296    | 2,336   | 536     |

a/ Data not available.

Source: Census of Canada.

Cattle numbers show considerable variation with the largest numbers being reported in the thirties; the figure was low in 1941 but increased again by 1946. Hog numbers fluctuate rapidly and it is quite likely that

their numbers at some times may have been much higher or lower than the information for the census year indicates. Sheep are unimportant in this area. The horse population, as elsewhere, has declined rapidly in recent years, there being only half as many horses in 1946 as there were 15 years ago (Table 2).

#### Land Acquisition and Tenure

The present operators obtained ownership of their land in different ways. Nearly 75 per cent of the owned land was acquired by purchase, about 17 per cent as gifts and legacies and about eight per cent through settlement programs for service veterans. Homesteading, once an important method of acquiring land, was resorted to by only one of the present operators.

The size of a farm is not permanently fixed. A farm may be adequate in size at one time, but over the years it may become too small to be a successful farm. About two-thirds of the farms of the survey added to their original holdings, some farms making only one addition but others making several additions (Table 3). Purchase was the method most frequently used to acquire the original holding and to add land to it. Slightly more than half of the operators did not add to their original holdings, 30 per cent made only one addition and the remainder added land to their farms two or more times. The original holdings were larger than the size of any subsequent additions. The average size of the holdings for those who did not increase their size of farm was about 445 acres; tenants started with the biggest farms, just over 500 acres, and very few added to this. The starting size for the farmers who added to their original holdings was about 279 acres.

Table 3.- Methods Used to Acquire Original Holdings and Make Additions to Farm, 93 Farms in the Hamiota Area

| Acquisition          | Method of Acquisition |            |        |      |          |             | Years        |               |
|----------------------|-----------------------|------------|--------|------|----------|-------------|--------------|---------------|
|                      | Number                | Purchasing | Legacy | Rent | Settling | Acquisition | since making | last addition |
| Original holdings    | 93                    | 100        | 46     | 16   | 21       | 10          | 364          | -             |
| First addition       | 45                    | 48         | 24     | 6    | 15       | -           | 260          | 8.5           |
| Second additions     | 17                    | 18         | 14     | -    | 3        | -           | 199          | 9.8           |
| Subsequent additions | 5                     | 5          | 4      | 1    | -        | -           | 192          | 5.0           |

The type of farm tenure in this area has been broken down into three groups: owners, tenants, and part-owners. Of the 93 records obtained, there were 56 farmers who owned all the land they operated, 16 who rented all their land, and 21 who owned part and rented part of the land they operated..

The present operators had been on their farms for an average of 15 years. Almost a quarter of them had operated their farms for more than 25 years, while one-third had been on their farms five years or less. The tenants usually stayed on their farms for a shorter period. The average length of tenure on the rented farms was six and a half years, with about one-fifth of the tenants staying for more than ten years. The most common term of lease was three to five years.

#### Prosperity of the Area and the Operators

The prosperity or productive capacity of a district is often judged by the financial situation of its farmers. It is, however, difficult to give a statistical presentation of what has been accomplished in a district since its first settlement. In the first place, only the experience of those who remain can be studied, and usually it is only the more successful who remain; in the second place, it is impossible to measure the capital that was brought in and the amount that was taken out by those who left. In farming it is the custom for each successive generation on leaving the farm to take a considerable part of the money value of their property with them. The succeeding generation raises money through mortgages and other types of loans to pay the previous occupants and finance the operation of the farm. Each generation then begins again the job of paying for the land and its improvements, and until these obligations are met, further improvements must be delayed.

However, something of the prosperity of a district can be learned from the financial statements of the present occupants. There is always some shifting in and out of every district, and those coming may bring in as much as is taken out by those who are leaving. In this district the average length of occupancy for the present operators is relatively short, although the term of occupancy ranges from one year to more than 60 years. Nearly half of the present occupants were born in the district and in most cases were probably sons of earlier settlers. When the present occupants of the land are descendants of the original settlers there should probably be a greater proportion of the farm value remaining in the district in the way of inheritance and improved farms than where the farm is sold to strangers or non-relatives.

Net Worth of the Present Operators.— The average gain in net worth for the farms of the survey since the present operators started on the farms was about \$16,000 (Table 4). Owners and part-owners made a total gain averaging about \$17,500. Tenants made a total gain of half that amount. Owners and part-owners of course had much higher net worths when starting than the tenants did. Although the renters had been on their farms for a shorter period and had lower starting and present net worths, their average yearly gain in net worth from all sources was higher than that for the other tenure groups. The renters had an average yearly gain of over \$1,300, the owners \$1,171 and part-owners \$1,097.

Table 4.- Average Net Worth at Time of Starting and at Present,  
by Types of Tenure, 93 Farms in the Hamiota Area

| Tenure      | Number of farms | Net worth |            |
|-------------|-----------------|-----------|------------|
|             |                 | At start  | At present |
| - dollars - |                 |           |            |
| Owners      | 56              | 8,310     | 25,869     |
| Part-owners | 21              | 7,244     | 24,798     |
| Renters     | 16              | 4,165     | 12,712     |
| All tenures | 93              | 7,356     | 23,363     |

Those farmers who have been on their land for 15 years or less have made an average annual gain in net worth of \$1,940 compared with \$647 for those on the farms longer than 15 years. Those starting in the last 15 years had a starting net worth of \$8,240, compared with \$5,852 for those starting earlier. The older farmers have a present net worth of \$29,711 compared with \$19,705 for those starting in the last 15 years. The high prices of the recent war period have been mostly responsible for the rapid progress of those starting on their present farms in the past 15 years.

Those who have been on the farms for less than 15 years have made the largest average annual gain but part of this gain is merely the result of changing price levels. On the other hand the relatively favourable yields and prices for farm products in recent years have made it possible for these farmers to make very rapid progress.

Assets.- The distribution of the assets by types of tenure is illustrated in Table 5. Farm real estate made up about 44 per cent of the owners' and 37 per cent of part-owners' total assets but represented only a small fraction of the renters' assets. Part-owners had the largest investment in working capital, such as equipment and livestock, and the lowest investment in other assets. The renters, on the other hand, had a much smaller investment in machinery and livestock. "Other assets" include such things as bonds, bank accounts, accounts receivable, household goods and other property not part of the farm.

The valuation of the assets was affected to some extent by current price levels. On the whole, however, it is felt that the values assigned to the assets were conservative. The long-time price was kept in mind when inventory values were obtained. In valuing livestock, current market prices were used for market stock and a "normal" value was assigned to the breeding herd. Because auction sale prices were bound to influence the evaluation of second-hand equipment, in some cases inventories may be valued higher than their remaining use and long-time resale value would seem to justify.

Table 5.- Average Operators' Assets by Types of Tenure,  
93 Farms in the Hamiota Area, 1948

| Items                    | Tenure |             |         | All<br>tenures |
|--------------------------|--------|-------------|---------|----------------|
|                          | Owners | Part-owners | Renters |                |
| - dollars -              |        |             |         |                |
| Farm real estate         | 12,217 | 10,281      | 147     | 9,703          |
| Equipment and machinery  | 5,180  | 5,986       | 3,836   | 5,130          |
| Livestock                | 2,245  | 3,390       | 1,764   | 2,421          |
| Seed, feeds and supplies | 1,717  | 1,651       | 1,034   | 1,585          |
| Other assets             | 6,273  | 5,303       | 6,179   | 6,038          |
| Total assets             | 27,632 | 26,611      | 12,960  | 24,877         |

Liabilities.- Liabilities for all types of tenure were small. Only about one-third of the farms reported any land indebtedness; their land debts averaged about \$3,300 per farmer. On the basis of all farms included in the survey, land debts made up more than three-quarters of all indebtedness. Fifteen farmers owed money on their equipment and machinery, the average being about \$500 per farm. Sixteen farmers had personal and bank loans outstanding. Only three farmers were in arrears for land taxes.

The average debt according to type of tenure for the farms reporting indebtedness amounted to \$2,661 for owners, \$2,379 for part-owners and \$794 for renters. About one-third of the owners, one-quarter of the part-owners and two-thirds of the renters had no debts.

#### FARM ORGANIZATION

From the information collected there did not appear to be any significant variations in patterns of farm organization. The most prominent type was the general type of farm, with production of cereal crops the most important enterprise and beef cattle the main livestock enterprise. Most of the farms kept some livestock, which in many cases satisfied only part of the family needs; other operators kept fairly large herds of cattle that provided a fair amount of income.

In the present section most of the data on farm organization will be presented in terms of averages for the area and in relation to size of farm.

#### Land Use

The farms of the Hamiota area are located on fertile soils and in a good crop district but a rather large proportion of the total farm area is not suitable for crop production: sloughs, low spots in the field and patches of brush, bush, waste land and natural prairie account for a little

more than one-third of the total farm area. The average farm of the area contained 447 acres of which 288 acres were used for grains and tame grasses (Table 6). Of the 153 acres of unimproved land only 62 acres were natural prairie and hay sloughs, the remainder being brush or waste that provide little grazing. Wheat, the most important crop, occupied one-quarter of the cropland and was followed by barley in order of importance. More than one-third of the cropland was in summerfallow. The high proportion of summerfallow reflects the need of weed control and also the tendency to follow a rotation with a large portion of the cropland in fallow to provide land suitable for, and more likely to produce, a good crop of grain for cash sale. The acreage in grasses and legumes for seed, hay and pasture was relatively unimportant and occupied less than two per cent of the cropland.

Table 6.- Utilization of Land, Hamiota Area, 1947

| Use                    |             |             |                   |       |
|------------------------|-------------|-------------|-------------------|-------|
|                        | Average per | Per cent of | Per cent of total |       |
|                        | farm        | cropland    | assessed acres    |       |
|                        |             |             |                   |       |
|                        | - acres -   |             | - per cent -      |       |
| Wheat                  | 74          | 25.7        |                   |       |
| Barley                 | 54          | 18.8        |                   |       |
| Oats                   | 40          | 13.9        |                   |       |
| Flax                   | 6           | 2.1         |                   |       |
| Grasses and legumes    | 3           | 1.0         |                   |       |
| Improved pasture       | 2           | .7          |                   |       |
| Summerfallow           | 109         | 37.8        |                   |       |
| Total cropland         | 288         | 100.0       |                   | 64.5  |
| Acres in farmstead     | 6           | -           |                   | 1.3   |
| Total unimproved acres | 153         | -           |                   | 34.2  |
| Total assessed acres   | 447         | -           |                   | 100.0 |

There was little variation in the patterns of land use between farms of different sizes. In general, however, flax was produced on the larger farms and was grown on only one of the half section and one of the quarter section farms. About a fifth of the farmers grew flax and had an average of about 19 acres per farm in that crop. All of the farms grew wheat and only two farms did not grow oats and barley. A little less than one-fifth of the farms had legumes or grass hay, and the average acreage in these crops was about 18 acres per farm. Most of the hay was on farms greater than a half section. Only about one farm in seven had improved pasture and their average acreage in improved pasture was 12 $\frac{1}{2}$  acres.

## Livestock

Nearly all the farms kept some livestock. There were cattle on 95 per cent of the farms and hogs on nearly 75 per cent. Sheep were kept on only two farms. The percentage distribution of farms keeping livestock of the different kinds and the numbers per farm is indicated in Table 7.

Cow numbers averaged eight head per farm and ranged from one to 25 on those farms where cows were kept. The most common size of herd ranged between four and eight cows, but about one-third of the farms kept herds of ten or more cows. Other cattle (all cattle other than cows) averaged about 12 head per farm and ranged in numbers from one to 40 head. There was about one head more per farm at the end of the year than at the beginning.

On the average, there were six hogs per farm reporting them. Many farmers prefer not to keep hogs and buy only weanlings to be raised for home use.

Table 7.- Number of Farms Having Livestock and Number per Farm,  
93 Farms in the Hamiota Area, 1947-48

| Kind of livestock | Number of farms reporting | Per cent of farms reporting | Average number |
|-------------------|---------------------------|-----------------------------|----------------|
| Cows              | 88                        | 95                          | 8              |
| Other cattle      | 88                        | 95                          | 12             |
| Sheep             | 2                         | 2                           | 26             |
| Hogs              | 73                        | 78                          | 6              |
| Chickens          | 91                        | 98                          | 155            |
| Horses            | 88                        | 95                          | 4              |

There were about 155 chickens, including hens and young chicks, on the farms throughout the year. The number increased from an average of 139 at the beginning of the year to 173 at the end. The prevailing practice for flock replacement is to buy hatchery chicks each year. Nearly three-quarters of the farms bought an average of 160 chicks but some bought as many as 700.

Horses were becoming a less important source of power for field work. Only three farms used horses exclusively and even on those farms some field work was hired. However, even though horses were unimportant as a source of field power, 95 per cent of the farms still had an average of four work horses per farm. Fifty-six of the 93 farms in the survey had four or more horses and 24 had six or more horses. The chief use for horses now seems to be for winter driving and chores; however, many farmers still use horses during harvesting, as harvesting with the binder and threshing with team and rack and separator is still common in this area. About nine per cent of the farms raised colts during the year.

The size of the various livestock enterprises did not vary a great deal according to size of farm, with the exception of cattle and poultry, where numbers increased with increases in size of farm. On farms of less than 241 acres there were 6.2 animal units of cattle, more than twice this number on farms of 401 to 560 acres, and 19.1 units on farms greater than 720 acres. Poultry numbers on the largest farms were nearly double those on the smallest farms.

Farm Capital

The family farm is the predominant type of farm organization, with the father as operator and other members of the family providing the labour force. Hired labour is also used on some of the larger farms. The average capital investment was about \$15,500 per farm, including \$8,300 in real estate, over \$4,000 in machinery, \$2,000 in livestock and the remainder in seed, feeds and supplies on hand. The total investment was not high; the farms were not very large and most of them included a large area of low value and unimproved land. The average investment in real estate was only \$8,305 per farm, or about \$19 per acre. Investment in machinery, on the other hand was relatively high at about \$14 per acre. The distribution of investment according to type and size of farm is illustrated in Table 8.

Farm Capital and Size.— The distribution of the farm capital among the different components of capital according to size of farm showed an interesting pattern. The proportion of real estate to total capital was 56 per cent on the half section farms and 49 per cent on farms larger than 720 acres. The highest percentage investment in machinery, 29 per cent of the capital invested, was found on the largest farms and the lowest, 25 per cent, on the quarter and half section farms. Nearly 17 per cent of the total capital on the quarter section farms was invested in livestock and on the largest farms nearly 11 per cent. Investment in seed, feeds and supplies increased from 3.5 per cent on the smallest farms to 11 per cent on the largest farms. The largest farms had relatively high inventories of grain.

Table 8.— Average Farm Capital by Size of Farm, Hamiota Area,  
1947-48

| Size of farm<br>(total acres) | Capital investment |           |           |                              |        | Total |
|-------------------------------|--------------------|-----------|-----------|------------------------------|--------|-------|
|                               | Real<br>estate     | Machinery | Livestock | Seeds, feeds<br>and supplies |        |       |
|                               | — dollars —        |           |           |                              |        |       |
| up to 240                     | 3,723              | 1,686     | 1,132     | 240                          | 6,781  |       |
| 241 - 400                     | 6,508              | 2,869     | 1,643     | 526                          | 11,546 |       |
| 401 - 560                     | 9,926              | 4,721     | 2,212     | 1,417                        | 18,276 |       |
| 561 - 720                     | 10,423             | 5,271     | 2,919     | 1,458                        | 20,071 |       |
| 721 and over                  | 12,973             | 7,759     | 2,869     | 2,954                        | 26,555 |       |
| All farms                     | 8,305              | 4,037     | 2,050     | 1,088                        | 15,480 |       |

Farm Capital and Tenure.— The distribution of farm capital according to various types of tenure is illustrated in Table 9. The fully-owned farms had the largest investment in real estate. The part-owner farms had an investment in machinery of \$13 per acre of cropland, the owners \$15 per acre, and the tenants an investment of \$11 per acre. The livestock investment was highest on the part-owner farms, although it would be difficult to state whether or not this relationship is a causal one related to tenure or if it is merely a result of size, as this group

contained the largest farms. The tenants had the lowest investment in machinery, an indication that they are just starting farming or that they place less reliance on mechanization than the other tenure groups in the conduct of their farm operations.

Table 9.- Average Farm Capital by Types of Tenure, 93 Farms in the Hamiota Area, 1947-48

| Types of tenure | Capital investment |           |           |                           |  | Total  |
|-----------------|--------------------|-----------|-----------|---------------------------|--|--------|
|                 | Real               | Machinery | Livestock | Seeds, feeds and supplies |  |        |
|                 | Estate             |           |           |                           |  |        |
| - dollars -     |                    |           |           |                           |  |        |
| Owners          | 12,089             | 4,810     | 2,179     | 1,434                     |  | 20,512 |
| Part-owners     | 9,548              | 5,611     | 3,239     | 1,579                     |  | 19,977 |
| Renters         | 148                | 3,566     | 1,696     | 1,079                     |  | 6,489  |

Tables 8 and 9 suggest that farms generally require a fairly large outlay of capital to be adequate in size and in equipment supplies. The major part of the capital was for land and buildings and machinery, and livestock capital made up a minor part of the total. The building up of livestock capital is generally considered to be a simple matter because of the "natural increase" characteristic of livestock production. The assumption of a rapid growth in livestock capital, however, gives little relief from the requirements of large capital outlays, as real estate and machinery make up the largest part of the farm capital. The growth in capital through "natural increase" in livestock is hardly enough to provide the large amounts of capital required on a large and mechanized farm. This points up the difficulty that operators of small farms or rented farms often encounter in securing sufficient capital to develop a good farm unit.

Machinery and Equipment.-- The farms of the survey were quite highly mechanized, as indicated by the relatively high investment in machinery. Tractors provided practically all of the power for field operations. Of the 93 farms in the survey there were only three with no tractors and one other farm borrowed a tractor. There were 113 tractors, or an average of 1.2 tractors per farm, with about 25 per cent of the farms having two tractors. The adoption of tractors for power is fairly recent in this area, about 22 per cent of the tractors being one and two years old and about half of them less than eight years old.

The majority of farms in this area had either a car or a truck. Nearly 90 per cent reported one car and about five per cent had two cars; however, unlike the tractors, which were about eight years old, most cars were much older, the average age being 12 years. Slightly more than a quarter of the farms had trucks. The most common size was of a ton or ton and a half capacity. The availability of a small farm truck provides the small farmer with the means to haul his produce, and provides the transportation for personal and family needs.

The method of harvesting is undergoing change. The old method of cutting with a binder and threshing the grain with a threshing machine is still common but is being replaced by the use of swathers and combines. Slightly more than one-half of the farms reported a separator and one-third of the farms had combines. Threshers last a long time on most farms, the average age of these machines being 23 years; some farms that still have them use them only for threshing oats and barley feed.

There are always some farmers who, for various reasons, hire some of their field and farm work done, and there are others that do some of this work for their neighbors and supplement their own income by doing it. This situation was true in this area. Although about three-quarters of the farmers owned a grain separator or a combine, or both, about a third of the farmers found it necessary to hire all or part of their threshing and combine work. This provided an opportunity for others to supplement their income. Trucking of grain was the work most frequently hired; most of it was probably done by commercial truckers rather than by farmers. Trucks with a large hauling capacity require large investments and operating costs, so rather than buy a large truck many farmers prefer to own a car or a small truck and hire extra trucking when needed. Table 10 presents figures on hired and custom farm work.

Table 10.-- Number of Farmers Hiring Farm Work Done and Number Doing Custom Work, 93 Farms in Hamiota Area, 1947-48

| Type of operation | Hiring work |                      | Doing work for others    |                         |
|-------------------|-------------|----------------------|--------------------------|-------------------------|
|                   | Number      | Average amount spent | Number doing custom work | Average amount received |
|                   | hiring      | spent                | custom work              | received                |
|                   | - number -  | - dollars -          | - number -               | - dollars -             |
| Field cultivation | 10          | 58                   | 6                        | 134                     |
| Threshing         | 24          | 112                  | 11                       | 231                     |
| Combining         | 11          | 264                  | 12                       | 279                     |
| Trucking          | 71          | 71                   | 7                        | 208                     |
| Other work        | 9           | 26                   | 2                        | 40                      |

Farm Buildings.-- Information was obtained on the size and condition of farm houses and barns. The houses and barns were divided into three groups according to size and three groups according to condition. Small houses were those having one to three rooms, medium size ranged from four to nine rooms, and large houses those with ten or more rooms. The farms in the area were generally well built up and the buildings were in fair condition. Ten per cent of the houses were classed as small, 51 per cent medium size and the remainder were large. Nearly one-quarter of the barns were described as small, 43 per cent medium sized and one-third were large. The houses were in a better state of repair than the barns. Fifteen per cent of all houses were considered to be in poor condition, nearly two thirds in fair condition and the remainder good. Of the barns, more than a third were poor, 54 per cent in fair condition and only 11 per cent good.

Receipts

The farmer's income is secured from two main sources, farm production and from non-farm sources. The income from farm production may be in the form of cash received from sale of produce, it may be in the form of farm perquisites, or an increase in inventory resulting from increased values and production of livestock and increased holdings or carryovers of grain and supplies on the farm.

Wheat sales made up more than one-third of the total cash receipts and all grain sales made up about 61 per cent. Cattle sales made up most of the receipts from livestock while receipts from all classes of livestock and sales of livestock produce made up about 25 per cent of the total revenue. Sales of the previous year's crops were fairly important and indicate a large carryover of grain. The income of \$167 per farm from sale of equipment, although not a large amount, indicates that farms were selling, or trading in, a considerable amount of their older equipment. The distribution of receipts according to size and source is described in Table 11.

Table 11.- Sources and Average Amounts of Receipts, Hamiota Area, 1947-48

| Source                         | Average amount per farm |               |
|--------------------------------|-------------------------|---------------|
|                                | : Per cent of total     |               |
|                                | Dollars                 | farm receipts |
| Wheat                          | 1,714                   | 36.0          |
| Oats and barley                | 918                     | 19.3          |
| Other crops                    | 275                     | 5.8           |
| Cattle                         | 545                     | 11.5          |
| Hogs                           | 211                     | 4.4           |
| Horses, sheep, poultry         | 72                      | 1.5           |
| Farm produce                   | 372                     | 7.8           |
| Equipment sales                | 167                     | 3.5           |
| Custom work                    | 66                      | 1.4           |
| Previous year's crop           | 408                     | 8.5           |
| Other farm receipts            | 13                      | .3            |
| <hr/>                          |                         |               |
| Total cash receipts            | 4,761                   | 100.0         |
| <hr/>                          |                         |               |
| Increase in inventory          | 1,845                   | -             |
| Receipts from non-farm sources | 966                     | -             |
| Home consumed farm produce     | 363                     | -             |

The total cash receipts were \$1,831 on farms of 240 acres or less, \$3,100 on farms of 241 - 400 acres, \$5,526 on farms of 401 - 560 acres, \$6,549 on the 561 - 720 acre group, and \$10,164 on farms greater than 720 acres. Wheat was the most important source of revenue on all sizes of farms, but made up a smaller percentage of total receipts as the size

of farm increased. On the other hand, amounts and percentage of receipts from coarse grains and flax increased as the size of farm increased, making up 11 per cent of total cash receipts on the smallest farms and 33 per cent on farms greater than 720 acres. The percentage of total receipts from livestock and farm produce decreased from nearly 35 per cent on the smallest farms to less than 30 per cent on three quarter section farms and to 15 per cent on the largest farms. Sales of grain from the previous year's crop were 2.5 per cent of the total on the smallest farms and nearly 15 per cent on the largest ones.

A considerable amount of income was received during the current year from non-farm sources. Family allowances, pensions and dependents' allowances contributed an average of \$90 per farm. Payments on participation certificates for crops marketed in years prior to the year of survey were received during the year under review and were considered as non-farm income. They averaged \$370 per farm. Other non-farm income amounted to nearly \$400 per farm and came from such sources as teaching school, co-operative dividends or legacies and gifts.

#### Expenses

Two classes of expenditures are incurred in the operation of a farm: one is for current account and the other for capital account. Current farm operating expenses may be divided into two sub-classes, cash and non-cash. The cash items consist of things such as taxes, real estate repairs, feeds, livestock supplies, cost incurred in operating equipment, and hired labour. Non-cash expenses consist of items such as family labour; the family labour may not receive a stated wage, but if it were not available other labour would have to be hired. The item is considered a legitimate charge against the farm and is valued at the same rate at which hired labour is paid.

The largest item of cash expenses was for operating and repairing the special and general equipment. It made up about one-third of the total farm expenses on all sizes of farms, but increased from \$250 on the smallest farms to \$1,600 on the largest ones. The cost of labour, paid and unpaid, was another large item, accounting for nearly 24 per cent of the total. The amount of paid labour increased as the size of farm increases. Unpaid labour as a percentage of total expenses was highest on the three-quarter section and half-section farms, 9.8 and 9.2 per cent respectively, and about the same, five per cent, in the other size groups. Custom work made up ten per cent of the total on the smallest farms and gradually decreased to 1.4 per cent on the largest farms.

Expenditures on capital account include purchases of machinery and equipment, livestock for productive purposes, and more or less permanent improvements made to real estate during the year. Depreciation on machinery and buildings is allowed at established rates and is accounted for in the decrease of inventory, which also includes decreases in value of livestock and seeds, feeds, and supplies on hand. Capital expenditures, which represent additions to investment made during the year, were large and averaged slightly more than \$2,000 for all farms. These expenditures were \$985 on the smallest farms, \$1,264 on the 241 - 400 acre farms,

\$2,567 on the 401 - 560 acre farms, \$1,807 on the 561 - 720 acre group and over \$5,000 on the largest farms. Over \$1,100 of this new investment was for new machinery with the largest farms buying over \$3,800. Expenditures for land and improvements to real estate averaged about \$675 per farm, \$144 of it being for installation of hydro, which service was extended to the district during the year of the survey.

Decreases in inventories during the year were small, there being no large decreases on any of the farms. For all farms there was a net increase of \$1,408 (inventory increase was \$1,845 as shown in Table 11). The increases in inventory were mostly due to increases in stocks of grain, increased values of livestock, and very large purchases of equipment during the year. The purchase of equipment contributed the largest amount to increase of inventory.

Table 12.- Average Farm Expenses, Hamiota Area, 1947-48

| Expenses                    | Average amount per farm |                 |
|-----------------------------|-------------------------|-----------------|
|                             | : Per cent of total     |                 |
|                             | Dollars                 | : farm expenses |
| Taxes on real estate        | 227                     | 10.0            |
| Purchased feeds and pasture | 46                      | 2.0             |
| Other livestock costs       | 19                      | .8              |
| Real estate                 | 97                      | 4.3             |
| Seed purchased              | 91                      | 4.0             |
| Operating special equipment | 676                     | 29.7            |
| General equipment repairs   | 108                     | 4.7             |
| Custom work                 | 122                     | 5.4             |
| Hired labour and board      | 373                     | 16.4            |
| Other farm expenses         | 343                     | 15.1            |
|                             |                         |                 |
| Total cash expenses         | 2,102                   | 92.4            |
| Unpaid labour and board     | 172                     | 7.6             |
|                             |                         |                 |
| Total farm expenses         | 2,274                   | 100.0           |
| Capital expenditures        | 2,025                   | -               |
| Decrease in inventory       | 437                     | -               |

Living Expenses

Farm perquisites cover only part of the living requirements of the operator and his family. A number of other items must be paid for in cash, and the amount expended usually is greater than the value of the perquisites obtained from the farm. Average expenditures for the different cash items are shown in Table 13. The average cash living costs were just over \$1,600 per farm. If the perquisites are added to the cash cost the total living costs were \$2,237.

Table 13.- Average Farm Family Cash Living Costs, Hamiota Area, 1947-48

| Item  | : | Amount      |
|---|---|-------------|
|   | : | - dollars - |
| Groceries                                   |   | 408         |
| Fuel  |   | 79          |
| Household furnishings                       |   | 108         |
| Clothing                                    |   | 186         |
| Life insurance                              |   | 61          |
| Health                                      |   | 62          |
| Church and charity                          |   | 44          |
| Education                                   |   | 45          |
| Personal                                    |   | 487         |
| Auto (operating costs chargeable to living) |   | 142         |
| <br>Total                                   |   | 1,622       |

The variation in cash living expenses is much greater than the variation in the value of the perquisites. The average cash living costs on the half section farms were \$1,071 and on the farms larger than 720 acres were nearly double, averaging \$2,042 per farm. The total value of perquisites does not vary a great deal from farm to farm and most of the variation is due to higher value of farm houses. The value of perquisites on the half section farms was \$534 and about \$775 on the farms greater than a half section.

Of the various items going to make up cash living costs the amount spent for groceries and fuel is usually the largest. The personal item, which includes things such as holidays and entertainments, is also large but includes an average of \$168 paid for income tax. Part of the cost of operating a car was also charged to living expenses.

## Measuring Farm Success

Success in farming refers here to financial success. It may be questioned whether financial gain is the proper yardstick of farm success. To give a broader picture to the meaning of success in farming the following criteria of success may be used: (1) a farm must be able to meet all expenditures incurred in its operation; (2) it must pay the prevailing rate of interest on all capital invested; (3) it must pay fair wages to the farm operator for his labour and management, and (4) the fertility of the soil must be maintained. The last one of these four requirements may be difficult to measure in terms of financial gain. Disregarding for the time being the criterion of maintenance of soil fertility the measurement of success with respect to the other factors can be proceeded with.

Common Measures.— There are several measures used in analysing a farm business, most of them expressing some form of return to labour. The measure chosen depends on the purpose of the analysis and the illustrations to be made. Three of the most common measures are net farm income, labour income and labour earnings.

"Net farm income" is the compensation for farm capital and for the labour and management of the operator with an expense allowance made for unpaid family labour. It is calculated by deducting farm expenses from farm income. "Labour income" is the operator's net farm income with a deduction made for interest on his capital. "Labour earnings" is the operator's labour income plus the value of farm perquisites. Perquisites include the use of the farm house and products raised on the farm and consumed by the farm family.

Labour income is an easy figure to compute; family living expenses are excluded and it is not necessary to make an estimate of the value of the use of the house and of home-consumed food. Labour earnings, on the other hand, provide a closer approximation of the real earnings of a farmer. Figures on net farm income, labour income and labour earnings according to type of tenure are presented in Table 14. The farm receipts are made up of current farm receipts and increases in inventory. Farm expenses include current farm expenses, decreases in inventory and expenditures on capital account. Charges for depreciation are included in changes in inventory. In calculating labour income, interest at the rate of five per cent on the operator's capital is used. In his business the farmer is a capitalist, a manager and a labourer. He may own all the capital invested in the business or he may have borrowed part of it. As an owner of part or all of the capital which he has invested in the business the farmer is entitled to charge the business for the use of the capital, just as if he were paying for operating on borrowed capital. That which remains after the interest charge is deducted is the return to operator for his labour and management.

In addition to labour income the farmer receives the use of the farm house and the farm produce consumed in the home. The value of these perquisites varies in accordance with the kind of house, the convenience and comfort it offers and the quality, quantity and variety of farm products. The value of the perquisites added to labour income gives the labour earnings. There is one disadvantage in using the labour earnings measure and that is the difficulty of valuing the produce consumed in the home. Actual quality may vary a great deal from farm to farm and to get around this the prevailing practice is to value the same kinds of produce on all farms at the same price. As a result, actual earnings from farm produce are much the same except where sizes of households are different and there is a corresponding difference in the amount of farm produce consumed.

Table 14.- Net Farm Income, Labour Income and Labour Earnings, According to Type of Tenure, 93 Farms in the Hamiota Area, 1947-48

|                     | : Owners | : Part-owners | : Renters |
|---------------------|----------|---------------|-----------|
| - dollars -         |          |               |           |
| Total farm receipts | 7,999    | 10,204        | 5,290     |
| Total farm expenses | 5,500    | 7,410         | 3,852     |
| Net farm income     | 2,499    | 2,794         | 1,438     |
| Labour income       | 1,473    | 1,795         | 1,114     |
| Perquisites         | 648      | 774           | 606       |
| Labour earnings     | 2,121    | 2,569         | 1,720     |

#### MEASURING THE EFFICIENCY OF FARM OPERATION

In the previous section, terms used in measuring the success of the farm business were discussed, and it was shown that no one alone is completely satisfactory. In this section the factors affecting farm profits will be discussed and profits will be referred to as operator's labour earnings.

#### Size of Business

One of the most important factors determining the volume of income is the size of the farm business. Over the years, records show that large farms are the most profitable. In comparing the earnings of different farms with respect to size of farm, a measure suitable to the type of farm and farm organization is required. On grain farms the number of acres of cropland is probably the best measure. On livestock farms the number of cows or animal units may be a better measure. In mixed farming areas where crops and livestock may be of equal importance, a measure such as productive man work units <sup>1/</sup> may be a better measure.

In this study, to show the relationship of size of business to returns, two measures are used. In Table 15 the size of the business is measured by the total number of acres in the farm. It is seen in <sup>1/</sup> that as the farms increased in size the labour earnings also increased. More livestock is kept on the larger farms and, although the management may be more intensive on the smaller farms, the scale of enterprise on

<sup>1/</sup> A man work unit is the amount of crop work and work with livestock accomplished in a ten hour day, at average working rates.

the larger farms had a more direct bearing on the increase in returns.

Table 15.- Relation of Size of Business, Measured in Acres and Labour Earnings, 93 Farms in the Hamiota Area, 1947-48

| Size of business<br>(total acres) | Productive:          |                 |        | Operator's  |
|-----------------------------------|----------------------|-----------------|--------|-------------|
|                                   | acres of<br>cropland | Animal<br>units | labour | earnings    |
|                                   |                      |                 |        | - dollars - |
| Less than 240                     | 113                  | 8.3             |        | 873         |
| 241 - 400                         | 203                  | 11.0            |        | 927         |
| 401 - 560                         | 330                  | 16.2            |        | 1,928       |
| 561 - 720                         | 401                  | 18.8            |        | 2,359       |
| 721 and more                      | 549                  | 22.4            |        | 4,399       |

Table 16 illustrates the relation between different sizes of farm business when measured by man work units. Here again the larger the farms the greater the returns. The earnings increased from \$902 on farms with less than 200 work units to \$4,077 on farms with over 350 work units. Such marked increases in earnings with increased size of business are to be expected when prices of farm products are rising and yields are maintained. The same direct relationship between increased size and earnings exists in periods of relatively stable price relationships. However, when prices received for farm products are falling without a corresponding reduction in costs, deficits rather than surpluses may occur, and these may be greater for the larger size businesses.

Table 16.- Relation of Size of Business, Measured by Man-Work Units and Labour Earnings, 93 Farms in the Hamiota Area, 1947-48

| Size of business<br>(man-work units) | Productive:        |                      |                 | Operator's         |
|--------------------------------------|--------------------|----------------------|-----------------|--------------------|
|                                      | Number of<br>farms | Acres of<br>cropland | animal<br>units | labour<br>earnings |
|                                      |                    |                      |                 | - dollars -        |
| 200 and less                         | 23                 | 196                  | 8.1             | 902                |
| 201 - 250                            | 14                 | 312                  | 10.8            | 1,387              |
| 251 - 300                            | 17                 | 364                  | 13.6            | 2,095              |
| 301 - 350                            | 18                 | 396                  | 19.4            | 2,157              |
| 351 and more                         | 21                 | 469                  | 28.7            | 4,077              |

While it has been indicated that returns have risen with increased size of farm, it should not be assumed that a continuous increase in the size of farm will give continued and proportionate increases in returns. The upper limit to the maximum size of a farm depends on the ability of the operator to supervise all operations. This usually means

a farm that will employ two to four men during the year or the equivalent of two all-year-round paid employees in addition to the operator's own family. Not many of the farms in the survey employed a labour force of this size.

Crop Yields

There is a direct relationship between crop yields and earnings; usually, the higher the yield the greater the earnings. It was observed that among farms of the same size those with the highest yields had the greatest earnings. The relationship between yield on farms of the same general size and labour earnings is shown in Table 17. The yields are expressed in terms of crop indexes. An index of 100 refers to an average yield for the crop in the area, and in this study is based on three crops, wheat, oats and barley. The index for any farm is weighted for these crops in proportion to the average yields and acreages of these crops for the area. An index of 100 indicates an average yield of all crops; an index of 115 indicates a yield of 15 per cent above average.

Table 17.- Relation of Size of Farm and Yield to Labour Earnings,  
93 Farms in the Hamiota Area, 1947-48

| Size of farm and yield | : : : : : Average |            |                   |             |
|------------------------|-------------------|------------|-------------------|-------------|
|                        | : farms           | : acre     | : crop:operator's | : yield     |
|                        | : Number of       | : cropland | : index           | : earnings  |
|                        |                   |            |                   |             |
|                        |                   |            |                   | - dollars - |

Less than 400 total acres

|                            |    |     |     |       |
|----------------------------|----|-----|-----|-------|
| Crop yield index--below 90 | 10 | 180 | 76  | 752   |
| 90 - 110                   | 8  | 204 | 97  | 781   |
| over 110                   | 7  | 171 | 124 | 1,307 |
| all indexes                | 25 | 185 | 100 | 917   |

401 - 560 total acres

|                            |    |     |     |       |
|----------------------------|----|-----|-----|-------|
| Crop yield index--below 90 | 13 | 326 | 77  | 1,408 |
| 90 - 110                   | 7  | 329 | 106 | 2,013 |
| over 110                   | 7  | 338 | 124 | 2,810 |
| all indexes                | 27 | 330 | 100 | 1,928 |

More than 560 total acres

|                            |    |     |     |       |
|----------------------------|----|-----|-----|-------|
| Crop yield index--below 90 | 12 | 441 | 75  | 1,243 |
| 90 - 110                   | 15 | 471 | 101 | 2,849 |
| over 110                   | 14 | 440 | 128 | 4,830 |
| all indexes                | 41 | 451 | 100 | 3,055 |

The variation in earnings with variation in yield is most noticeable on the largest farms; in the group with farms larger than 560 total acres, a yield of 25 per cent above average gives a return nearly four times as large as a yield 25 per cent below average. Normally with high yields a relatively large return may be expected from a medium or large size business, but with low yields there may be a deficit and it will very likely be so if prices are also unfavourable.

Up to this point the analysis points to a direct relationship between an increase in yields and increased returns. Nevertheless, it must not be assumed that an attempt to secure maximum yields will bring maximum returns. Recognition of the fact that the principle of diminishing returns operates in agricultural production leads one to realize that maximum physical yields do not necessarily mean maximum earnings. What the farmer must know and recognize is that, while the repeated application of given resources, such as fertilizers or rotations, may result in increased yields, the increased returns may not cover the added cost of the resources used.

#### Livestock Production

Associated with crop yields are yields from livestock or the rates of production of livestock. These rates of production are usually expressed in terms of the main product from each class of livestock; for example, pounds of butterfat per cow or eggs per hen. While this study is of general scope and not enough detail is available to consider the relationship between rates of production in the various livestock enterprises and earnings, the average livestock enterprises on these farms are large enough to justify some measuring of the efficiency of the production.

Table 18.- Relation of Efficiency in Livestock Production to Operator's Labour Earnings, 93 Farms in the Hamiota Area, 1947-48

| >Returns per \$100 invested: | : Productive farms | : Number of animal units per farm a/ | : Average investment in livestock | : Average returns | : Average labour earnings |
|------------------------------|--------------------|--------------------------------------|-----------------------------------|-------------------|---------------------------|
|                              |                    |                                      |                                   |                   |                           |
| - number -                   |                    |                                      |                                   |                   |                           |
| 0 - 59                       | 33                 | 17.7                                 | 2,830                             | 1,198             | 1,815                     |
| 60 - 119                     | 44                 | 17.3                                 | 2,159                             | 1,800             | 2,572                     |
| 120 and more                 | 15                 | 11.6                                 | 1,280                             | 1,835             | 1,948                     |
| All farms                    | 92 b/              | 16.5                                 | 2,256                             | 1,590             | 2,199                     |

a/ Productive livestock are those livestock other than horses. An animal unit is the equivalent from the standpoint of feed consumed and manure produced to tone mature cow.

b/ One farm did not have any productive livestock.

Efficiency in livestock production can be measured by the returns from livestock in relation to the investment in livestock; this measure will be used here. The investment in livestock is the value at the beginning of the year of all productive livestock plus the value of any purchases made during the year. The returns from the livestock will be the sum of sales of livestock and livestock produce plus value of produce consumed in the home plus any change in investment value.

Table 18 shows the relationship between efficiency in livestock production and labour earnings on the farms of the survey. The farms with the lowest returns per \$100 investment had the largest investment in livestock but the lowest livestock returns and labour earnings. About 90 per cent of the animal units of these farms were cattle and the remainder were evenly divided between hogs and poultry. The medium and most efficient groups sold, respectively, 2.1 and 1.6 times as much cream, milk and butter as the least efficient group. In addition their hog and poultry enterprises, which are more intensive types of production, were about twice as large as the least efficient group.

On the medium and most efficient groups about 16 per cent and 31 per cent, respectively, of the animal units were hogs and poultry. The medium efficient group operated their cattle herds more intensively than the other two groups and also had the largest receipts from hogs. While the group of producers with more than \$120 livestock returns per \$100 investment were considered the most efficient producers, their enterprises were not very big and so did not have much effect on labour earnings. A combination of size and good production rates are necessary in livestock production as well as in crop production if the enterprise is to increase the labour earnings significantly. The most efficient livestock production was on farms with fewer acres of cropland, which helps to explain why labour earnings were low on this group of farms.

However, probably the most significant feature of this analysis of the livestock enterprises on these farms is not the effect of efficiency on labour earnings but the effect of the type and organization of the livestock enterprise on livestock returns and on labour earnings. Different kinds of livestock and even different types of management of the same kind of livestock bring different returns for amounts invested in them and for the labour, feed and other inputs expended. While cattle enterprises were dominant on most of these farms, hog and poultry enterprises were fairly prominent on others. The livestock enterprises were probably selected to fit in with the crop enterprises, avoiding competition for labour and making use of unimproved land, by-products of crop production, buildings, available markets, skills and aptitudes of the operator and the labour, and not on the basis of gross returns from investment in them. Once the enterprise is selected, returns from it will depend on how well it is managed with regard to feeding, selection and maintenance of high quality herds and flocks. Building investments should be kept to a minimum that will provide good sanitary shelter and allow labour to be used efficiently.

### Combination of Enterprises

In selecting a combination of enterprises major consideration must be given to: (1) the opportunity of increasing returns by adding enterprises to supplement returns from the principal type of production, and (2) the manner in which these enterprises supplement returns.

In general there is one product which is the most profitable major type of production for an area and an individual farm. It may be determined by the physical factors affecting yields, or marketing factors determining relative prices of products and production costs. In many cases where the production of a single most profitable product leads to specialized production, and where the production of a most profitable product for a farm can be extended to a large size of business, such specialized production with a single enterprise can constitute an effective organization of the farm. The selection of a suitable supplementary enterprise can improve the income from specialized production if it can make use of labour in slack periods and use significant amounts of by-products or waste land; it must avoid conflicts with the main enterprise.

In addition to the increase in income provided by the supplementary enterprises, diversification enables the farmer to reduce the risks involved in specialization. Probably the major considerations in adding enterprises to specialized production are those pertaining to risk reduction and the maintenance of soil fertility. There is a greater assurance of regular income through diversification than through specialization. There are distinct advantages to be gained from operating a business which yields a steady income rather than one which yields a fluctuating income. There is usually less risk in a farm business that has several enterprises than a business with only one. Losses in all enterprises seldom occur at the same time. Diversification also permits a fuller use of labour, waste land, and by-products, and a more efficient use of capital.

Although diversification may offer the possibility of a higher and more stable income, it is no more a guarantee of success than specialization. There are chances of high losses in a diversified business as well as in a specialized one, because in diversification there are more avenues for losses, just as there are more for gains. Diversification requires capable management. Success in diversification depends upon the choice of enterprises. Obtaining the best balance of enterprises requires careful appraisal of the individual farm and the opportunities that exist for diversification. The appraisal should be made in terms of long-time adaptability of enterprises rather than in terms of temporary price advantages of one product over another.

In this area, wheat growing is the major enterprise, although oats and barley are also of importance and occupy a prominent place in the farm production program when they offer particular advantages in fitting into the rotation or cropping program. But for the most part there is little opportunity for diversification of production by diversification of the cropping program, as the choice of crops is limited. There are

some farms where wheat is the major enterprise and its production is considered to be specialized. On the other hand, most of the farms in the area are in a position to profit through some diversification by the addition of livestock. There is a relatively large amount of unimproved land on the farms and although it may be difficult to use it efficiently on some farms, on others it is so located as to permit full use by grazing animals. There are also opportunities for hog production as feed grains are available and production conditions for them are relatively favourable. In addition the labour force available on most farms makes it easier for some diversification through livestock to be carried out.

To measure the extent of diversification, the farm records were grouped according to the percentage of total farm returns received from livestock production. The effect of diversity on farm organization and on the use of the various factors of production is illustrated in Table 19. The extent of diversity is indicated as follows: those farms which secure ten per cent or less of their returns from livestock production are the least diversified, and although they probably all have some livestock of each kind it is in many cases just sufficient to satisfy home needs; they are farms on which grain production predominates. The other groups represent farms which derive greater parts of their returns from livestock and are considered to be more highly diversified.

Generally, the most diversified farms had lower labour earnings than the least diversified ones, except that the farms which secured ten and 25 per cent of their returns from livestock production had the largest labour earnings. It will be noted that these farms were the largest ones and had the greatest acreages of cash grains and the highest receipts from grain. The percentage of cropland in wheat and flax was about the same on the least diversified two groups and was about five per cent lower on the most diversified two groups. Oats and barley, on the other hand, occupied a greater proportion of the cropland on the most diversified farms. The acreages in hay and pasture were not large for any of the groups, indicating that grasses and legumes are not an important part of the rotation and that improved pastures are relatively unimportant in providing grazing.

Crop sales, of course, were closely related to the size of the farm and the receipts from wheat and flax were highest on the farms with the most acres in these crops. Likewise, the total sales of livestock and livestock produce were greatest on the farms with the most livestock. The least diversified farms had less than five animal units which represents about enough livestock to satisfy family needs. The most diversified farms had more than five times as much livestock and more than six times the receipts from livestock of the least diversified ones. Cattle were the most important class of livestock. However, hogs and poultry were more important on the most diversified farms. Where cropland and pasture land are not available or are being fully utilized, more intensive livestock production can be attained through hog and poultry enterprises.

There was more labour available on the most diversified group of farms, but there was not a great deal of difference in the other three groups.

The percentage of total labour spent on livestock increased from six per cent on the least diversified farms to over 50 per cent on the most diversified farms. Total farm capital was generally highest in the least diversified groups, reflecting the influence of size of farm on real estate investment and the fact that machinery investments were highest on the least diversified farms.

Table 19.- Relationship of Diversification to Farm Organization and Efficiency in Factor Use, 93 Farms in the Hamiota Area, 1947-48

|                                  | Per cent of farm returns from<br>livestock production |        |        |        |        |
|----------------------------------|---|--------|--------|--------|--------|
|                                  | 0 - 10.0:10.1-25.0:25.1-40.0:40.1 and more            |        |        |        |        |
|                                  | :   | :      | :      | :      | :      |
| Number of farms                  |   | 413    | 30     | 27     | 23     |
| Cropland                         | acres   | 368    | 413    | 303    | 290    |
| Cropland in wheat and flax       | %   | 30     | 31     | 25     | 25     |
| Cropland in oats and barley      | %   | 29     | 29     | 34     | 37     |
| Hay, improved pasture            | acres   | 4      | 7      | 6      | 4      |
| Crop sales                       | \$  | 4,523  | 4,643  | 2,805  | 2,369  |
| Livestock and farm produce sales | \$  | 342    | 1,230  | 1,184  | 2,186  |
| Total productive animal units a/ | no.   | 4.9    | 16.8   | 15.7   | 23.0   |
| Animal units of cattle           | no.   | 4.0    | 15.2   | 13.2   | 18.1   |
| Animal units of hogs             | no.   | .4     | 1.0    | 1.7    | 3.1    |
| Animal units of poultry          | no.   | .4     | .7     | .8     | 1.6    |
| Man equivalents b/               | no.   | 1.58   | 1.65   | 1.57   | 1.82   |
| Per cent of labour on livestock  | %   | 6      | 35     | 40     | 52     |
| Total farm capital c/            | \$  | 24,242 | 25,102 | 19,364 | 18,852 |
| Per cent of capital in machinery | %   | 28     | 24     | 20     | 19     |
| Per cent of capital in livestock | %   | 3      | 9      | 12     | 18     |
| Capital per man equivalents      | \$  | 15,343 | 15,213 | 12,333 | 10,358 |
| Operator's labour earnings       | \$  | 2,274  | 2,630  | 1,980  | 1,666  |

a/ Productive livestock consists of livestock other than horses. An animal unit is the approximate equivalent from the standpoint of manure produced and feed requirements of a mature cow. The following numbers of livestock were considered equal to one cow: 1.4 steers and heifers; 3 calves; 3 sows or 5 other hogs brought to market weight; 7 ewes or 14 lambs brought to market weight; 100 hens.

b/ One man equivalent is equal to 12 months of labour on the farm.

c/ Total farm capital includes landlord's capital.

The most diversified farms were the smallest farms, although the less diversified farms had the higher earnings. The smallest farms stand to gain the most from diversification. The larger farms are of a size that permits

relatively efficient use of power machinery and returns a satisfactory income to the operator without requiring the additional capital and often greater labour requirements of livestock production.

The small farms on the other hand, are limited in acreage and often in capital; moreover, they are not suited to efficient use of power machinery. Again, they may have sufficient unimproved land suitable for pasture, and a labour force of sufficient size to permit incorporation of livestock in the farm program. Where the pasture, labour and by-products of grain production are available, diversification through livestock provides a method by which the smaller farms can increase their earnings.

#### Efficiency in the Use of Factors of Production

The importance of attaining a good size of business and good rates of production for both crops and livestock has been indicated. It is equally as important to be efficient in the use of labour and capital. Efficiency in use of the factors of production is interrelated with size of business, rates of production and combination of enterprises.

Efficiency in Use of Labour.— There is more gainful work accomplished during the year on some farms than on others. If it is assumed that all the workers have an equal capacity to perform work and that the farm operator, his family, and hired labour work up to capacity, there will still be large differences in the amount of work done. These differences will be determined to a large degree by the following factors: 1/

1. The rate of working and how well the effort is distributed. It is possible to work too hard by spells, by fits and starts, and not get as much work done as if the work had been done at a steady rate.
2. The amount of motion and effort which is saved. It is possible in some types of jobs to accomplish much more work with less effort if the amount of waste motion is cut down.
3. How busy the worker is kept at useful tasks. It is not easy on farms to always have some useful work at hand, and so farm labour is more or less idle a good deal of the time.
4. Whether the most important thing is done at the time. A lot of labour is wasted when machines break down in the field. The machines should be repaired before they are put to work.
5. Probably most important of all, is what other factors of production the worker associated himself with and in what proportion — that is what power and machinery, land, fertilizers, livestock, etc. There is, as with other factors of production, a combination of these with his effort which gives the least combined cost for them. His interest is in applying these to himself to the point where he will get the highest profit.

1/ Black, J.D. Clawson, et al. Farm Management, The MacMillan Co. New York. 1949. p. 546.

The usual farm operator is a combination of labourer, manager and capitalist and he divides his thinking and his time between these three roles. His economic objective is to secure the largest return from a combination of all three. The degree of success attained depends on how effectively he organizes his work and how effectively he combines his labour with capital (including land). The effectiveness of this combination changes as size of farm changes. Usually it results in greater efficiency and larger farm returns. The effectiveness of association of labour with other factors of production according to size of farm is shown in Table 20. The amount of work accomplished per man varied from the handling of 117 acres and 7.9 animal units on farms of 160 acres or less, to 286 acres and 9.4 animal units on farms larger than 400 acres. The increase in cropland acres and animal units handled per man indicates fairly well that the larger farms provide an opportunity to accomplish more work per man. Of course another factor permitting a greater output per unit of labour input is the greater amount of capital the worker on the larger farms usually has to work with.

Table 20.- Measures of Labour Efficiency in Relation to Size of Farm,  
93 Farms in the Hamiota Area, 1947-48

| Size of farm: No. of farms | Man equivalent: per farm | Cropland acres: per man equivalent | Productive animal units per man equivalent | Average capital per man equivalent: dollars |             |
|----------------------------|--------------------------|------------------------------------|--|---|-------------|
|                            |                          | - number -                         | - acres -                                  | - number -                                  | - dollars - |
| 160 or less 7              | 1.09                     | 117                                | 7.9  | 7,936                                       |             |
| 161 - 240 19               | 1.31                     | 156                                | 8.5  | 10,373                                      |             |
| 241 - 320 10               | 1.48                     | 201                                | 10.1                                       | 12,850                                      |             |
| 321 - 400 30               | 1.78                     | 199                                | 11.2                                       | 13,108                                      |             |
| 401 - 480 13               | 1.96                     | 222                                | 9.4  | 13,543                                      |             |
| More than 480 14           | 2.00                     | 286                                | 9.4  | 16,810                                      |             |

Efficiency in Use of Capital.— The more efficient use of labour on some farms than on others was made possible by the use of time-saving machinery in the fields; it is also likely that some farmers have buildings and farmstead layouts that make it easier to get more work done.

Table 21 shows the relation of capital to labour efficiency on farms of different sizes. On farms with up to 240 acres of cropland there was an average investment in farm machinery of about \$2,730 per farm; on farms with 241-400 cropland acres it was \$4,650 and on farms with more than 400 acres it was \$7,300.

The ratio of capital to labour and especially the ratio of machinery to labour are significant in relation to size. On the smallest farms there appears to be an uneconomic substitution of machinery for labour, or it may have been an over-investment in machinery. However, within the small farm group, even more labour, larger farms and more equipment did not result in much higher work output as measured by acres of cropland and animal units handled per man. The low capital farms had the highest labour earnings. It would appear that high capitalization has resulted in disproportionately high interest and depreciation costs on these small farms.

Table 21.- Capital and Labour Efficiency According to Size of Farm and Capital Available, 93 Farms in the Hamiota Area, 1947-48

|  | Acres in cropland |          |           |         |              |         |        |  |
|--|-------------------|----------|-----------|---------|--------------|---------|--------|--|
|  | 0 - 240           |          | 241 - 400 |         | 401 and more |         |        |  |
|  | low               | high     | low       | high    | low          | high    |        |  |
|  | capital           | capital  | capital   | capital | capital      | capital |        |  |
|  | farms a/          | farms b/ | farms     | farms   | farms        | farms   |        |  |
| Number of farms                                | no.               | 13       | 13        | 21      | 19           | 15      | 12     |  |
| Man equivalents                                | no.               | 1.12     | 1.38      | 1.59    | 1.83         | 2.02    | 1.94   |  |
| Farm capital per man equivalent                | \$                | 8,094    | 11,197    | 11,597  | 14,464       | 12,351  | 18,641 |  |
| Machinery per man equivalent                   | \$                | 1,064    | 2,656     | 2,439   | 3,007        | 2,521   | 5,170  |  |
| Cash expenses (less labour) per man equivalent | \$                | 627      | 718       | 787     | 756          | 957     | 1,018  |  |
| Acres of cropland per man equivalent           | acres             | 146      | 148       | 186     | 212          | 231     | 285    |  |
| Animal units per man equivalent                | no.               | 6.7      | 9.8       | 8.9     | 12.9         | 10.1    | 9.8    |  |
| Operators' labour earnings                     | \$                | 981      | 726       | 1,854   | 2,246        | 3,024   | 4,133  |  |

On the farms with 241 - 400 acres of cropland more capital and machinery per man equivalent on the high capital farms has resulted in more acres and more livestock being handled per man and an increase in labour earnings. On farms with more than 400 cropland acres the labour force was about the same on both low and high capital farms. However, the amount of total capital and machinery combined with the labour was significantly greater than on the smaller farms. It should be noted that although the total capital per man on the high capital farms was about one and one-half times that on the low capital farms, the machinery per man was more than double.

The measurement of capital efficiency is closely related to efficiency in labour use. In this study, it was observed that labour productivity, in general, was directly related to the amount of capital. Although the labour force increased with the size of the farm, the amount of capital available increased at a greater rate, and the amount of machinery and equipment at a still greater rate. The labour force has increased with the size of farm and the availability of capital has permitted an increase in labour efficiency.

Building Investment and Use.— The average value of buildings, other than the operator's house, was just over \$2,000 on farms of less than 240 acres in cropland, \$2,738 on farms with 240 to 400 acres and \$3,300 on farms larger than 400 acres. Building investment per animal unit was \$192

on the smallest farms, \$146 on the medium sized farms and \$167 on the largest farms. The chief reason for a considerable amount of investment in buildings other than houses would seem to be the need to accommodate a large number of livestock, but the farms with the highest investment in buildings per animal unit did not have the most livestock. It would thus appear that some other factors than the number of livestock kept affect the total investment in buildings. There is, of course, the fact that many operators have acquired farms on which buildings were already constructed. The buildings may have been obtained at no great cost to the present operator, but the values placed on these buildings were influenced by the original cost and the use made of these buildings. In some cases the present buildings serve little use in the present farm organization and would not likely be reconstructed in their original form.

#### Organizing the Farm for Higher Profits

In organizing the farm, to obtain the most efficient use of the factors of production employed and to obtain the highest return, consideration must be given to the size of the farm business, rates of production of crops and livestock, efficient use of labour and capital. Where necessary and possible, consideration must also be given to a good balance or the best combination of enterprises.

In general, the relationship between size of business and rates of production to returns is well recognized. Where size of farm is limited and diversification possibilities are restricted the operator of a small farm faces a difficult task when he attempts to increase his returns. Where rates of production are low in comparison with rates prevailing in the community the operator must consider the adequacy and timeliness of his cultural practices and examine the suitability of his land for the various crops grown on that land. Livestock production practices and rates should be examined with respect to breeding and selection practices followed in building up the herds and flocks. Probably the most important factor affecting good livestock production is the response of the animals to feed.

Feeding practices should be examined to see if they fulfil all the requirements necessary for rapid growth, production, and health of animals. They should also be examined to see that the best and most economical feeds are being used, with consideration being given to the relative values of pastures, roughages, and grains. Good care of animals is also important if birth and disease losses are to be kept down. Building costs should be related to the returns to be expected from livestock. All buildings should provide a convenient arrangement for chores and the handling of livestock. Sanitation must also be given due emphasis. With regard to efficiency in the use of labour and capital, the operator is often faced with a dilemma. He may find it necessary to spend cash money and thus deplete his savings, or add to his debts to secure the labour and capital required to increase his returns. The employment of more capital and labour more than likely will give him a higher investment cost per unit. It should be noted, however, that a low investment per unit of production is not an end in itself but a means to an end, namely, lower cost of production. In many cases lower costs are the result of comparatively

high total investments in either farm machinery and buildings or both. Low costs and high returns are associated with high yields, which to some extent are determined by the manner in which land is farmed and the timeliness of the operations. The availability of sufficient and good machinery and labour make it possible to follow the best practices and secure the best yields. It is a part of a sound farm management plan to employ more labour, machinery and capital when it is reasonable to anticipate that these additional resources will add to net returns.

For the farms included in the present study, the labour problem consists in obtaining a reasonably high output from the farm family labour. In general, this implies a business of sufficient size, modern power and equipment, a good farm layout and, where possible, diversification of the farm business in order to make full use of the labour force throughout the year.

Efficiency in use of farm capital implies a low cost per unit of work. This can be achieved through the use of suitable and adequate power and machinery. Efficiency in capital use also implies that land is used to the best possible advantage, all tillable land is under cultivation and each part of the land is growing the crop for which it is best suited. Long-time efficiency in land use is based on economical methods of maintaining soil fertility. With regard to capital invested in buildings, efficiency implies a low cost in relation to the purposes served, careful planning in the erections of permanent buildings that are convenient, adequate, sanitary, and that can be replaced and maintained at reasonably low cost.

In the survey area the degree to which efficient use can be made of the factors employed in farm production depends on the proper combination of enterprises. On most farms, diversification offers an opportunity to secure greater returns.







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